CLAIMS:

I claim:

1) A ventilated wearer-powered protective suit consisting of:
- a body constructed of an impermeable, semi-permeable or permeable material capable of protecting the wearer from hazards such as: particulates, pathogens, chemicals, radiation, electricity, electromagnetism, heat, liquids or physical trauma or capable of protecting the surrounding area from hazards such as: particulates and pathogens,
- at least one bellows that is operated by the movement of the wearer,
- at least one one-way valve, of any of the well-known designs such as a flap valve or ball valve, spring assisted, gravity assisted or mechanically assisted, in the bellows, connected to the suit's body, constructed to allow ambient air to be forced from the bellows through the suit's interior and,
- at least one one-way valve, of any of the well-known designs such as a flap valve or ball valve, spring assisted, gravity assisted or mechanically assisted, in the bellows, constructed to allow ambient air to be drawn into the bellows from the ambient,
- permanently attached filtering and/or chemical absorbing elements in said valves to prevent harmful elements from passing through the valves or to prevent foreign materials from causing valve failure,
- air vents in the suit's body, with permanently attached filtering and/or chemical absorbing elements, to allow ambient air to pass through the suit's interior.

2) A protective suit described in Claim (1) that protects any part of the body such as: a suit that fully covers the body or a suit that partially covers the body, such as with uncovered hands, feet or head, or an upper body covering only or a lower body covering only.

3) A protective suit described in Claim (1) with a partial face shield or eye shield, a full face shield, or hood covering the head of the wearer, that has:

- at least one air vent to allow air to pass through the shield,
- at least one air outlet port connected to the suit's interior by an extension of the suit's body, or any other well-known connection technique between the shield and the suit's interior such as a flexible tube, to allow air to pass through the shield and the suit's interior,
- a sight window.

4) A protective suit described in Claim (1) in which the suit has loose fitting flexible material in the areas between the bellows and the body extremities, such as between an elbow fitted bellows and the wrists, to allow the extremities to move without affecting the bellows position.

5) A protective suit described in Claim (1) constructed, at least partially, of a permeable or semi-permeable material that is capable of passing a sufficient a quantity of air through the suit's body to reduce the vent area required in the suit or eliminate the use of air vents in the suit.

6) A protective suit described in Claim (1) in which the base of the bellows forms part or the protective suit's body.

7) A protective suit described in Claim (1) in which the bellows is constructed separately from the suit's body, with one of the one-way valves connected to the suit's interior by any well-known technique such as an extension of the suit's material or a tube.

8) A ventilated protective suit described in Claim (1) in which said bellows are placed in any position on the wearer's body in which movement of the wearer's body can expanded and collapsed the bellows, such as: the crotch of the elbow, the crotch of the knees, the buttocks, the crotch of the upper legs or in front of the hips.

9) A protective suit described in Claim (1) in which the bellows is of any of the well-known designs such as: a fan shaped bellows in which the corrugations meet at an apex, an expandable corrugated tube, a rectangular bellows such as used in an accordion or any expandable and collapsible enclosed shape such as an elastic flexible tube that self expands when forces are removed from it, a blatter or a sphere.

10) A protective suit described in Claim (1) in which the bellows has a base plate to hold the bellows in place when the wearer moves, with:

- the base plate formed to fit the circumference of the wearer's body part supporting the bellows,
- the ends of the base plate extended past the ends of the bellows,
- a flexible joint in the base plate in the crook of the joint operating the bellows.

11) A protective suit described in Claim (1) in which the bellows are held in place by straps, either self-adjusting elastic straps or adjustable length straps, built into the suit's material or separate from the suit's material.

12) A protective suit described in Claim (1) in which the bellows is held above the wearers body, to allow air to pass under and around the bellow's base, using any of the well-known techniques such as a three dimensional mesh, a double layered base or supports.

13) A protective suit described in Claim (1) in which a blatter, or blatters, with one-way valves, is placed between the upper legs to allow the blatter(s) to expand and collapse when the wearer walks.

14) A protective suit described in Claim (1) which has pockets located over the body joints (such as the elbow) opposite the bellows to orient the bellows when the joint is folded.

15) A pocket in Claim (14) made solely from the suit's material, or with addition reinforcement material in the pocket, that is either an integral part of the suit's body or separate from the suit's body, attached to the bellows by any of the well-known techniques such as with the use of straps or the suit's material.

16) A ventilated protective suit described in Claim (1) in which the bellows has:
- at least one one-way valve, connected to the suit, designed to allow air to be drawn from the suit's interior into the bellows and,
- at least one one-way valve designed to force air from the bellows to the ambient.

17) A protective suit described in Claim (16) that is constructed to allow the passage of air through the suit when it collapses under the negative pressure created when air is drawn through the suit, using any well-known technique such as: stays, reinforcing loops, convolutions, three dimensional lining, such as mesh, batting, netting or tubes that allows air to pass through the suit's interior.

18) A protective suit described in Claim (1) which has more than one one-way valve element in the one-way valves, connected in series, to allow for continued operation of the valves if one of the valve elements fails open (fails to close off the reverse flow of air).

19) A suit in Claim (1) constructed without filtering elements in the valve ports, to protect the wearer from harmful sources not requiring filtration such as: radiation, electricity, electromagnetism, heat, liquids or physical trauma.

20) A protective suit described in Claim (1) that contains replaceable particulate filtration and/or chemical absorption elements in the one-way valves.

21) A protective suit described in Claim (1), in which the vents that allow air to pass through the interior of the suit, are areas that are commonly designed to be open, such as: the end of the legs and arms, the waist of a jacket, under arm vents, back vents and closures such as zippers and buttons.

22) A suit in Claim (1) constructed without filtering elements in the air vents, to protect the wearer from harmful sources not requiring filtration such as: radiation, electricity, electromagnetism, heat, liquids or physical trauma.

23) A protective suit described in Claim (1) that contains replaceable filtration and/or chemical absorption elements in the air vents.

24) A protective suit described in Claim (1) in which the air vents are shielded to prevent entry of liquids such as rain or chemicals.

25) A protective described suit in Claim (1) that has:

- a protective breathing mask with permanent or replaceable filtering elements or,

-a protective breathing mask with an external source of air such as compressed bottled air or an air supplied by an attached line or,

-a breathing mask with dual one-way valves that draws air from, or forces air through, the protective suit's body such as described in the co-pending patent specification submitted by Robert B. Steinert, Customer Number 37498.